Lighting Control

Gebouwautomatiseringsoplossingen
LON-based Lighting Control System

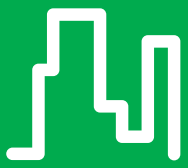
Schneider Electric

Wereldwijde specialist in energiemanagement

Energie & Infra

Industrie

Datacenters



Gebouwen

Woningbouw

Als wereldwijde specialist in energiemanagement met vestigingen in meer dan 100 landen, biedt Schneider Electric geïntegreerde oplossingen voor meerdere marktsegmenten waarbij leidende posities worden ingenomen in energie & infra, industriële processen, gebouwautomatisering, data- & netwerkcenters, alsmede een brede aanwezigheid in woningbouwapplicaties. Gericht op het veiliger, betrouwbaarder en efficiënter maken van energie, hebben 110.000 medewerkers in 2010 een omzet gerealiseerd van meer dan € 19,6 miljard. Dit mede dankzij de commitment mensen en bedrijven te helpen het beste uit hun energie te halen: make the most of your energy!

Schneider Electric

- De wereldwijde specialist in energie-management
- **110.000** medewerkers in meer dan **100** landen
- Een omzet van **€19,6** miljard in 2010
- Meer dan **200** fabrieken wereldwijd

Make the most of your energy

Schneider Electric

Gebouwen

Vliegvelden

Ziekenhuizen

Hotels

Industrie

Gebouwautomatisering
Schneider Electric heeft al meer dan 80 jaar ervaring in gebouwautomatiseringsoplossingen gebaseerd op een open geïntegreerde IT-structuur. Het portfolio bevat producten van TAC Vista, TAC I/NET, TAC Vista Security, TAC I/A series, Andover Continuum, Satchwell en Pelco. Deze oplossingen zorgen ervoor dat gebouwen comfortabeler, economischer en veiliger worden. Schneider Electric ondersteunt wereldwijd LonMark®, LonWorks®, en BACnet®.

Partners Schneider Electric
De gebouwautomatiseringsoplossingen van Schneider Electric worden op de markt gebracht in samenwerking met geselecteerde partners. Dit zijn getrainde system integrators, met ervaring en kennis van onze systemen, die samen met ons u een op maat gemaakte oplossing kan realiseren. Van ontwerp tot en met onderhoud.

More than just Lighting Control
Lighting Control Solutions, delivered as part of an integrated building management system from Schneider Electric, are a key tool in controlling energy use inside your buildings.

A lighting control system allows for flexibility in the utilisation of internal space. Regular and rapid changes in the use of buildings, and increasing expectations regarding comfort and performance, mean that lighting installations must be able to evolve to meet the requirements of an expanding business, or be easily adapted to suit new tenants. Lighting Solutions from Schneider Electric and its partners meet the needs of building users and owners by: reducing installation and operating costs, providing greater flexibility in the use of building space, helping building owners meet legal and building performance regulations.

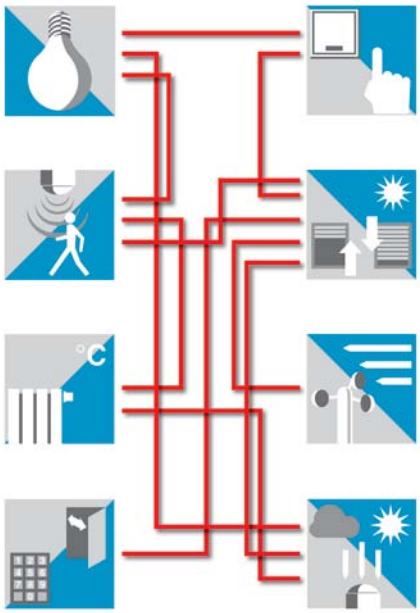
Table of Contents

Introduction 6
Lighting Control Solutions 7
Automating energy efficiency 8
Design Programme 10
Room Control Unit 11
LON I/O Modules 12
DALI Controller 14
DALI Gateway 15
Multisensors 16
Temperature Control 17
Lighting Control Products 18
System Components 18
Panels 19
Digital output 24
Sunblind 25
DALI Controller 26
DALI Multi-Sensors 28
Occupancy/Motion Detectors 28
Temperature Controllers 30
Dimmer Output 31
Digital Inputs 31
Combined In-/Outputs 33
Physical Sensors 33
Appendix A 34
Appendix B 36
Appendix C 37

Legend of pictograms

FTT LPT	Type of transceiver used
230V	Supply voltage 230V
24VDC	Supply voltage 24VDC
NEW	New article
OLD	Discontinued line
UPI	Universal plug-in available
SPI	Device specific plug-in available
IP	Ethernet/LON over IP
DALI	Digital Addressable Lighting Interface
BCU	Unit needs a bus coupling unit

Introduction



Buildings evolve and are transformed over decades. They need flexible systems that are designed to adapt to changing technologies and user demands. That is why the choice of a communications bus system such as LON is of such long-term importance. LON-based building management systems provide tremendous advantages to everyone involved:

Architects:

- The technical demands on building systems can be satisfied in a simpler, more flexible and cost-effective way.
- Control and display devices with bus capability combine all the functions of the different installation systems and at the same time provide a visually appealing design.

Builders and Operators:

- A cost-effective installation
- A high degree of flexibility, and financial savings, when the installation needs to be retrofitted or modified
- Reduction of operating costs by intelligent facility management
- "Transparency" of buildings by centralised annunciation, control and monitoring
- Standardised and easily comprehensible operation of the facilities
- Reduction of maintenance and service costs

Planners and Installers:

- Prevention of installation and planning mistakes thanks to an easy and comprehensible installation procedure
- Lower installation costs, in comparison to isolated solutions
- Facilitates compliance with regulations by reducing the risk of fire
- Reduced production costs due to the multiple use of sensors and the elimination of expensive gateway solutions for data exchange between individual systems
- Reduced training costs

Lighting Control Solutions

Applications

The use of an intelligent building system is particularly recommended for buildings which require an optimised installation in terms of maximum flexibility and comfort, combined with minimum additional cabling, e. g. in banks and building complexes, office and administration buildings, hospitals, hotels, department stores, industrial warehouses, schools etc.

Light and sunblind control is an important part of the system as it represents a major part of the potential energy savings.

Light Control

Lighting units may be controlled both centrally and locally. The light can be dimmed or switched at predetermined times. Lighting can be dimmed or switched at pre-determined times or made dependent on indoor or outdoor brightness levels, or occupancy as part of an overall building management strategy to reduce energy and operating costs.

Scene control is a strategy that includes the ability to store brightness levels and retrieve the settings via push buttons or an IR remote control as often as required, making it possible to operate any lighting scene within seconds.

Sunblind Control

Sunblinds can similarly be controlled both centrally and locally. Wind, rainfall and temperature sensors detect the weather conditions, and drive the outdoor venetian blinds automatically into a safe position if required. Via scene control, the sunblinds can adopt a preset position with one key press. The automatic panel adjustment function calculates the sun position depending on date, time and location of the building, and adjusts the panels to optimize transparency and glare protection.

Sunblind control can be combined with HVAC control taking into account incident solar radiation and room temperature to avoid overheating.

Automating energy efficiency

There are many buildings automation options that offer high energy saving potential. Building automation, and especially room automation, offers high energy saving potential.

Functions for Lowering Lighting Costs

Minimizing the use of artificial light in a room based on occupancy and needed brightness are key to saving the amount of energy used on lighting.

Constant Light Control

Multi-function sensors determine the brightness of the room and whether it is occupied. They transmit their data to dimmer actuators. If the room is not being used, the lighting stays off. If the room is being used, the dimmer actuators adjust the lighting to a precisely defined level of brightness. The energy savings are especially high if the room is well supplied with daylight, or if its use requires a high level of lighting. The savings potential is between 35 and 50 percent.

Brightness Dependent Lighting Control

This function basically corresponds to constant light control. Since switchable light actuators are used instead of dimmer actuators, the lighting level cannot be exactly set to the minimum level. For that reason, the energy savings potential is about 10 percent less than for constant light control, and is no higher than 45 percent.

Presence-Dependent Lighting Control

Presence/motion detectors can achieve energy savings by turning on lighting only when a room is occupied. The potential savings depends primarily on how much the room is occupied.

Sunblind Controlled by the Position of the Sun (Sun Automatic System)

Controlling the sunblind according to the position of the sun (also known as the sun automatic system) ensures that the sunblind automatically moves to a defined shield position when strong solar radiation is present. As soon as the intensity of the sunshine lessens, it is moved back. The savings are attributable particularly to the fact that automatic control is more effective than manual control. This reduces the need for artificial light. The savings potential is between 5 and 8 percent.

Slat Tracking

The “slat tracking” function ensures that the sunblind slats automatically adjust to the position of the sun. In this way they diffuse daylight that shines through the blinds for use in the room. Slat tracking can also reduce the proportion of artificial light. “Slat tracking” offers an energy lighting savings of 10 to 13 percent.

Interaction Between Slat Tracking and Constant Lighting Control

An integrated system permits functions such as slat tracking and constant light control to be used together and in coordination. This combination is especially advisable in rooms with a good supply of daylight. The savings here can be up to 30 percent.

Integrated Room Automation System

A precondition for the optimal effectiveness of all functions is an integrated room automation system, in which the different systems such as heating, cooling or glare shield work in unison. In an integrated room automation system, the sensors provide the information for all the systems while actuators and the lighting, heating, and cooling systems, provide simultaneous support.

Planning and Configuration of an Energy Saving Room Automation System

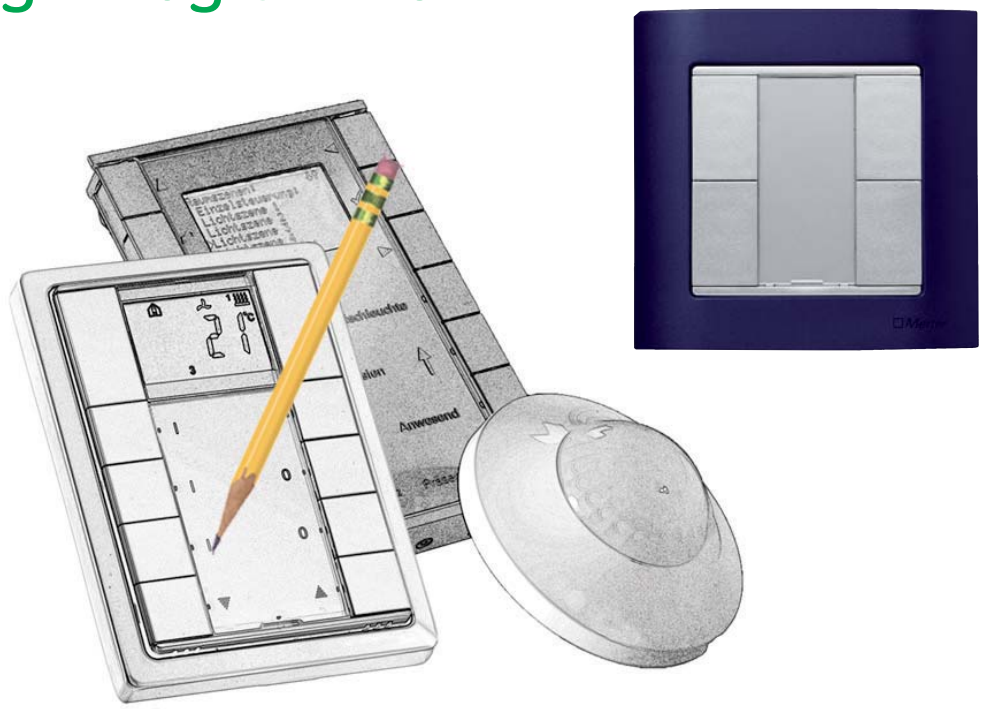
The planning and configuration of an energy saving room automation system is simplified by the fact that the room automation system functions conform to the LonMark profiles used around the world. With this system, room automation functions can be described clearly and comprehensively.

Once the desired room automation functions have been selected, the savings potential of the particular room automation solution devices can be configured.

Functions for Saving Lighting Energy

Room Automation Functions	Savings	Positive factors
Constant light control (presence-dependent, dimmed)	35 - 50%	- Good daylight supply - High lighting levels (>300lux) - Particularly efficient with slat control
Presence and brightness-dependent lighting control (switched)	25 - 45%	- Good daylight supply - High lighting levels
Automatic sun protection system	5 - 8%	- Good daylight supply
Slat adjustment	10 - 13%	- Good daylight supply - particularly efficient with constant light control
Automatic lighting or staircase lighting	No information	- Low presence levels (e.g. corridors)

Design Programme



Open building control systems provide synergy between individual systems. The functions of various individual installation systems are combined in one device. Light switches, thermostats and sunblind controls of different sizes, designs and colours are replaced with a single control and display device.

LON-interfaced Control Panels combine the performance capability of LON an unobtrusive design. Clearly arranged keys, lettering areas and displays allow the user to control the lighting, venetian blinds, heating, ventilation and other devices in the room effortlessly.

Schneider Electric offers a range of aesthetically appealing products including System-M.

System-M comprises ten modules – from a 1-gang push button to occupancy detector. Each is available in five colours. These modules can be combined with 27 different frames.

The ARTEC Program is timeless in design, with a clean, flush-fitting profile. It satisfies the demands of modern architecture, and is suitable for many different locations. Its premium stainless steel design provides the ideal surface for subtle but highly visible lettering.

The standard ARTEC inserts and frames stocked are in polar white glossy color and the SYSTEM-M inserts and frames are in polar white matt colour.

A selection of push button inserts and frames are available as non stock items sold separately.
For further details, see APPENDIX A.

Note: The frames are not included in the delivery of the modules and have to be ordered separately.

Room Control Unit

Room Control Units RCU-61 and RCU-101 are a combination of a temperature controller and a multi-function push button with display. The RCU-61 includes six, and the RCU-101 ten, large push buttons; either can be adapted to different individual functions.

Two push buttons each are reserved for temperature control.

The Room Control Units can control any operating resource installed in a room, either individually or in scenes, by a single device:

- Lighting and sunblinds
- Heating, air conditioning and ventilation

In addition, Room Control Unit RCU-101 can be activated by a remote control device which is available separately.

All design modules consist of application modules, frame and LON BUS Coupling Unit. (Unit “LON-BCU®”).

Schneider Electric’s third generation LON Bus Coupling Units feature a wide variety of application modules with low power consumption. Utilizing link power technology the LON-BCUs take power from the LON network, thus eliminating the need for an additional power supply.

The LON-BCU is configured with an LNS plug-in. All applications comply with the relevant LonMark standards.

LON I/O Modules

Lighting Control Solutions cover a wide range of functions, including;

- Digital Inputs for 24 V and 230 V input voltage, and for floating contacts
- Analog inputs and outputs
- Switching actuators with 24 V semiconductor outputs
- Switching actuators with relay outputs
- Phase controlled dimmers 1-10 V control devices for dimmable electronic ballasts
- LON DALI-Controllers for control of electronic DALI components

Most of the devices are suitable for DIN rail mounting. These devices are sub-classified into the three product lines M, N and S.

Cables can be attached to the inputs and outputs of most devices in the M, N, and S product range by using pluggable screw-type terminals that are easy to replace when necessary. This provides protection against polarity reversal should the device be replaced as well as accidental contact at any time.

Clamp-type terminals allow up to four bus cables to be connected to the device, so that the line is not interrupted if a device is disconnected from the network.

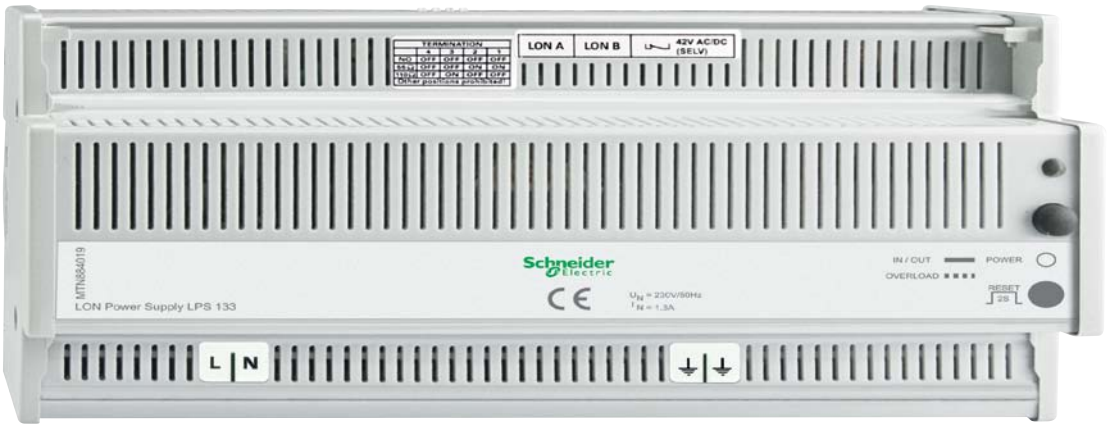
Power lines and bus cables may be installed without spacing. Single insulated wires or power lines and bus cables either have to be installed with a spacing of 4 mm or they need an appropriate insulation (DIN VDE 01 10-1). A protective cap is included with the REG-M and REG-N modules, to ensure a clear separation between the power line and bus cable.

The “DR-N” product line is the latest generation of I/O modules with the following features:

- Bus connection via 2-pin bus terminal with protective cap
- Pluggable screw-type terminals for inputs and outputs
- Status LED for every input and output
- Manual operation
- Free-Topology-Transceiver (FTT)
- DC 18...30 V supply voltage
- Configurable reaction of the outputs to power-down and power-up/reset

The ”DR-M” product line consists of about 20 I/O modules with the following distinctive features:

- Bus connection via 2-pin bus terminal with protective cap
- Pluggable screw-type terminals for inputs and outputs
- Link Power Transceiver (LPT)



LON Power Supply LPS 133

Link-Power-technology enables both data and the supply voltage for the control electronics can be transmitted via the LON network. For example, if the I/O modules are applied peripherally the complexity of cabling is minimised. LPT devices can be operated in combination with FTT devices in one subnet, but then they require an extra LON Power Supply.

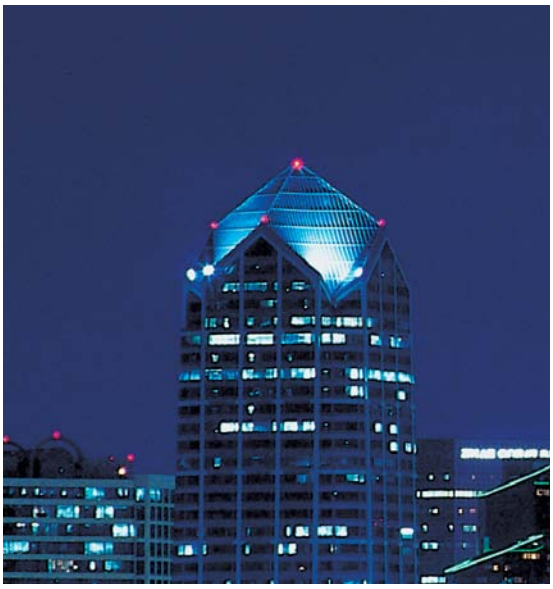
The ”DR-S” product line includes, the DALI Controllers, four I/O modules (available later, for the moment under re.design) with the following characteristics:

- Four resp. eight outputs and the same number of inputs for consumer loads and drives
- Status LED for every input and output
- Manual operation
- Pluggable screw-type terminals
- Free Topology Transceiver (FTT)
- 230 V supply voltage
- Configurable reaction of the outputs to power-down and power-up/reset

Conventional push buttons are normally connected to the digital inputs to operate the consumer loads at the outputs. The digital inputs can also be used for floating contacts, e.g. of motion detectors, photo-electric lighting controllers, or thermostats, independently of the outputs. The contact current is approximately 10 mA. The contact voltage of about 24 V is generated by the device itself, so that no external power supply unit is required. Every input status, as well as the output states, is indicated by a status LED. Every output can be operated manually, using the push buttons on top of the casing.

All cables can be connected to the device using pluggable screw-type terminals. The REG-S modules are some of the few LON actuators that provide the opportunity to configure the outputs’ reaction to power-down as well as to power-up/reset.

DALI Controller



In many applications, dimmable lighting systems are becoming more and more important. The previous gap in communication existing between the LON network and the lamps is closed by DALI. This Digital Addressable Lighting Interface is a standardised interface for electronic ballasts developed by the leading European manufacturers.

By means of ballast addresses, lamps of up to 64 DALI ballasts can be switched and dimmed individually via a common data line without the usual brightness gradient due to the resistance of the control line.

The DALI ballasts can be divided into 16 groups. Every ballast provides 16 scene memory units for light levels so individual atmospheres can be recalled directly.

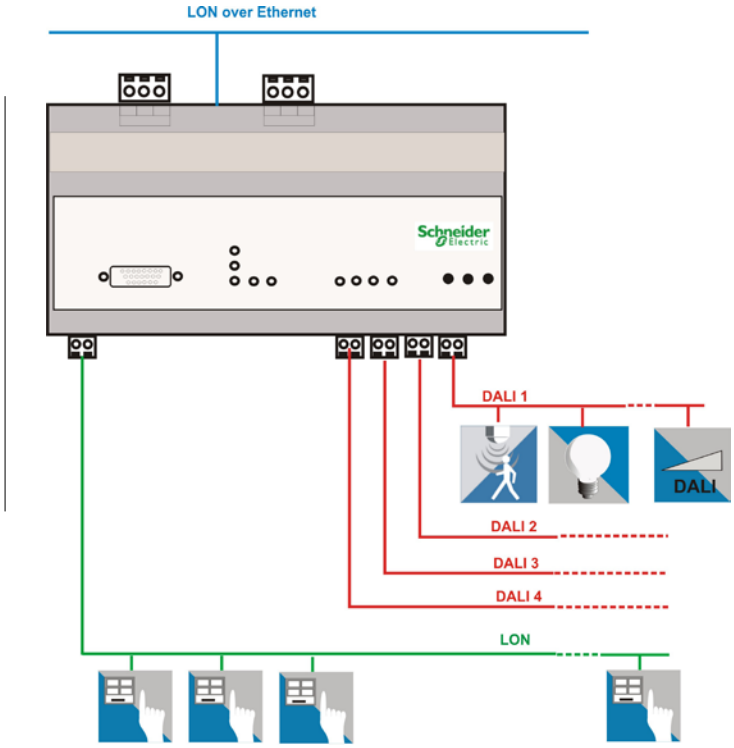
LON DALI Controllers DR-S 4DIM, 8DIM and 16DIM allow independent control of four, eight or 16 lighting groups respectively, according to the LonMark profiles. In addition, they provide scene control of the DALI devices. Different characteristic curves of dimmable electronic ballasts from various manufacturers are conformed to automatically.

The LON DALI Controllers are DALI system devices. They control all DALI ballasts and connected DALI multisensors*, and provide an interface between LON and the DALI bus. By use of the familiar LNS plug-in, the controllers can be configured and the DALI devices can be integrated completely in the LON bus system. Neither special accessory devices, nor software, are required.

The electronic DALI ballasts communicate bidirectionally, i.e. they can propagate their current state to other DALI devices. In combination with the appropriate equipment, lamps can announce failures to the LON DALI Controller. The latter transmits the message via the LON network to a building management centre or via a LON TCP/IP gateway to any other place in the world.

* Only DR-S 8DIM can control Dali multisensors LA 11

DALI Gateway



Up to 256 devices, divided into 64 DALI groups can be connected to the LON DALI Gateway REG 4x16 DIM with four DALI control lines.

In addition to the DALI connections, the gateway also has a LON Twisted-Pair interface with Free Topology Transceiver, as well as an Ethernet interface.

The TP/FT interface is intended for connection of up to 64 LON control units via an Ethernet interface. The LON DALI Gateway usually communicates with a superior light management or building automation system by means of LON over IP, via an Ethernet interface. Other DALI Gateways are also being addressed in this way.

By means of the integrated Ethernet interface, a hierarchically very even but powerful interface, network structure emerges without IP-gateways.

Normally initiation is also carried out via an Ethernet interface. The setting of all internal parameters and configurations can be carried out by an LNS-independent configuration tool.

For constant light control and scene control, all relevant LonMark objects, such as "Lamp Actuator", "Constant Light Controller", "Occupancy Controller" and "Scene Controller" can be custom configured in virtually unlimited quantities. The common restrictions with LON devices, for example the limitation of 15 address table entries, no longer exist. The LON DALI Gateway can also be connected to the DALI LA-11 Multisensor.

The DALI Multisensor is a combination occupancy and light sensor.

For the first time, a cost-effective solution for creating an intelligent lighting control, as well as its integration into building automation, is offered by LON DALI Controllers, respectively by a LON DALI Gateway, in combination with the DALI Multi-sensor.

Multisensors

A demand-responsive single room control helps save up to 70 percent of energy on lighting, heating and ventilation. One of several things that must be done is to detect brightness and presence in the room.

Based on passive infrared technology, the LA-21 and ILA-22 LON multi-sensors are designed for presence-dependent lighting control.

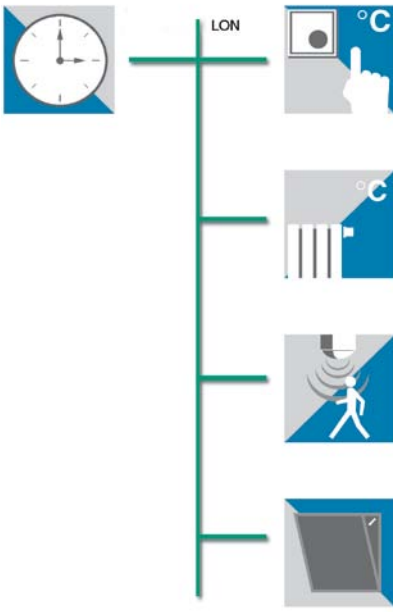
Installed at a height of 2.5 m, these multi-sensors detect movement in a circular range of 14 m.

The integrated light sensor is designed for daylight-dependent lighting control. Combined with the constant light controller objects of the dimmers, the 1-10 V control outputs or the DALI controllers, a cost-effective solution can be achieved.

The ILA-22 multi-sensor possesses an additional IR receiver. Combined with the remote control, it is possible to control scenes and sunblinds in addition to dimming and switching the lighting. The multi-sensors feature a LON interface with a link-power transceiver, and can therefore be connected directly to a LON network. A further auxiliary supply is not required.

The multi-sensors are particularly suitable for installation in single and open-plan offices, foyers, stairways, as well as class, conference and meeting rooms.

Temperature Control



It is quite common to configure single room temperature control with a central control unit in a star topography. However, this approach has many disadvantages:

- Extensive cabling between the devices
- Inflexibility due to fixed wiring
- Additional space is required for the control unit and cables
- The design of the control unit does not match the other switches and sockets.

Alternatively, the following approach can be adopted: the temperature sensor and the operating and control unit are integrated in one bus device ("Temperature Controller"). The controller transmits the manipulated variable via the LON network to an actuator (e. g. art. no. MTN887391) mounted on a cooling or heating battery, which converts the command into a corresponding valve movement. Floating contacts, e. g. of architrave-type switches at the windows, or dew point sensors can be connected directly to the digital inputs of the valve actuator.

Decentralised room control has the following advantages:

- Simple and cost-effective cabling
- High flexibility in case of alterations or extensions
- The controller is available in all versions and designs.

Besides the LON network, only a temperature controller with LON Bus Coupling Unit, and at least one LON valve actuator (or other actuator) is required. This combination can be retrofitted by an occupancy sensor or a system clock. Via the LON network, the decentral single room control can be linked to other installation systems, such as lighting, sunblind or access control.

Lighting Control Products

System Components

Power Supply LPS 133

Image	Part Number	Additional Information
	MTN884019	• Power supply for devices with Link Power Transceivers • Rated output current: • 1 A (short-circuit- and overload-proof) if supply voltage 85 V .. 195 V • 1.3 A (short-circuit- and overload-proof) if supply voltage > 195 V • Max. continuous output current: 1.3 A if supply voltage > 195 V • Bus power monitoring via relay output • Adjustable bus terminator for free or line topology or without termination • Supply voltage: AC 120/230 V (AC 85 .. 264 V) • DIN rail mounting according to EN 50 022 • Width of device: approx. 180 mm (10 pitch) NEW 230V LPT

Power Supply ABL8MEM24012

Image	Part Number	Additional Information
	ABL8MEM24012	• Power supply 24Vdc • Nominal output current: . 1.2 A) • Supply voltage: 100Vac to 240Vac • DIN rail mounting / panel • Width of device: approx. 72 mm (4 pitch

Bus Coupling Unit UP

Image	Part Number	Additional Information
	MTN880451	• Base module for flush-mounted LON devices • Screw fixing in flush-mounted boxes • Software applications according to LonMark profile “Switch (3200)” and “Scene Panel (3250)” to translate the signals of the • Connected application modules (push buttons, motion detectors, temperature controllers, etc.) into messages for light, sunblind, occupancy and single room temperature control LPT UPI

Panels

LON ARTEC Push button 1-gang

Image	Part Number	Appearance	Features
	MTN880701	polar white glossy	• Application module in Merten ARTEC design • Two push buttons for individually assigned functions • One status LED • Software application according to LonMark profile "Switch (3200)", "Scene Panel (3250)" and "Occupancy Sensor (1060)" for light, sunblind or scene and occupancy control To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured colour. Note: Picture includes frame UPI BCU
	MTN880711	stainless steel	

LON ARTEC Push button 2-gang

Image	Part Number	Appearance	Features
	MTN880721	polar white glossy	• Application module in Merten ARTEC design • Four push buttons for individually assigned functions • Two status LEDs • Other features as per LON ARTEC Push button 1-gang (art. no. MTN880701) • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured colour. Note: Picture includes frame UPI BCU
	MTN880731	stainless steel	

LON ARTEC Push button 4-gang

Image	Part Number	Appearance	Features
	MTN880741	polar white glossy	• Application module in Merten ARTEC design • Eight push buttons for individually assigned functions • Four status LEDs • Other features as per LON ARTEC Push button 1-gang (art. no. MTN880701) • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured colour. Note: Picture includes frame UPI BCU
	MTN880751	stainless steel	

LON ARTEC Room Control Unit RCU-61

Image	Part Number	Appearance	Features
	MTN880901	polar white glossy	• Application module with display in Merten ARTEC design • Backlit LC display • Four push buttons for individually assigned functions with a status LED for each push button • Two push buttons for setpoint adjustment and configuration of the display functions • Continuous action controller for heating and cooling incl. integrated temperature sensor • Calculates manipulated variables from setpoint and actual temperature values according to the particular operation mode • Can control valves or switching actuators in combination with an electro-thermal control valve • Two different setpoints for heating and cooling • Display to indicate room temperature and operation modes as per comfort, standby, night • Degree of protection: IP 20 • Software application according to LonMark profile “Switch (3200)”, “Scene Panel (3250)” and “Thermostat (8060)” for light, sunblind or scene and room temperature control • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured colour. Note: Picture includes frame UPI BCU
	MTN880911	stainless steel	

LON ARTEC Room Control Unit RCU-101

Image	Part Number	Appearance	Features
	MTN880921	polar white glossy	• Application module in Merten ARTEC design • Eight push buttons for individually assigned functions with a status LED for each push button • IR receiver for control of the button functions via IR Remote Control (art. no. MTN880991) • Piezo buzzer to indicate warnings or alarms • Other features as per LON ARTEC Room Control Unit RCU-61 (art. no. MTN880901) • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured colour. Note: Picture includes frame UPI BCU
	MTN880931	stainless steel	

Frame ARTEC 1-gang

Image	Part Number	Appearance	Features
	MTN481119	polar white glossy	• Frame 1-gang in Merten ARTEC design • Frames for multiple push button modules are available on request.
	MTN481146	stainless steel	

Frame ARTEC for RCU-101

Image	Part Number	Appearance	Features
	MTN481919	polar white glossy	• Frame for RCU-101 in Merten ARTEC design
	MTN481946	stainless steel	

LON System-M Push button 1-gang

Image	Part Number	Appearance	Features
	MTN881401	polar white matte	• Application module in Merten System-M design • Two push buttons for individually assigned functions • Two status LEDs • Software application according to LonMark profile "Switch (3200)", "Scene Panel (3250)" and "Occupancy Sensor (1060)" for light, sunblind or scene and occupancy control • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design. Note: Picture includes frame UPI BCU

LON System-M Push button 2-gang

Image	Part Number	Appearance	Features
	MTN881451	polar white matte	• Application module in Merten System-M design • Four push buttons for individually assigned functions • Two status LEDs • Other features as per LON System-M Push button 1-gang (art. no. MTN881401) To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design. Note: Picture includes frame UPI BCU

LON System-M Push button 4-gang

Image	Part Number	Appearance	Features
	MTN881501	polar white matte	• Application module in Merten System-M design • Eight push buttons for individually assigned functions • Four status LEDs • Other features as per LON System-M Push button 1-gang (art. no. MTN881401) • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design. Note: Picture includes frame UPI BCU

LON System-M Push button MF 4-gang

Image	Part Number	Appearance	Features
	MTN881601	polar white matte	• Application module in Merten System-M design • Eight push buttons for individually assigned functions • Eight status LEDs • Other features as per LON System-M Push button 1-gang (art. no. MTN881401) To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design. Note: Picture includes frame UPI BCU

LON System-M Push button MF-IR 4-gang

Image	Part Number	Appearance	Features
	MTN881651	polar white matte	• Application module in Merten System-M design • Eight push buttons for individually assigned functions • IR receiver for control of the button functions via IR Remote Control (art. no. MTN880991) • Eight status LEDs • Other features as per LON System-M Push button 1-gang (art. no. MTN881401) • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design. Note: Picture includes frame UPI BCU

LON System-M Room Control Unit RCU-61

Image	Part Number	Appearance	Features
	MTN880601	polar white matte	Application module with display in Merten System-M design • Backlit LC display • Four push buttons for individually assigned functions with a status LED for each push button • Two push buttons for setpoint adjustment and configuration of the display functions • Continuous-action controller for heating and cooling incl. integrated temperature sensor • Calculates manipulated variables from setpoint and actual temperature values according to the particular operation mode • Can control valves or switching actuators in combination with an electro-thermal control valve • Two different setpoints for heating and cooling • Display to indicate room temperature and operation modes as per comfort, standby, night • Degree of protection: IP 20 • Software application according to LonMark profile “Switch (3200)”, “Scene Panel (3250)” and “Thermostat (8060)” for light, sunblind or scene and room temperature control • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design. Note: Picture includes frame UPI BCU

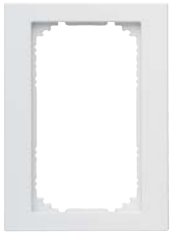
LON System-M Room Control Unit RCU-101

Image	Part Number	Appearance	Features
	MTN880621	polar white matte	• Application module with display in Merten System-M design • Eight push buttons for individually assigned functions with a status LED for each push button • IR receiver for control of the button functions via IR Remote Control (art. no. MTN880991) • Piezo buzzer to indicate warnings or alarms • Other features as per LON System-M Room Control Unit RCU-61 (art. MTN880601) To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design. Note: Picture includes frame. UPI BCU

Frame M-PLAN 1-gang

Image	Part Number	Appearance	Features
	MTN486119	polar white matte	• Frame 1-gang in Merten M-PLAN design • Frames for other colors are available on request, see appendix A for item selection • Frames for multiple push button modules are available on request.

Frame M-PLAN for RCU-101

Image	Part Number	Appearance	Features
	MTN587319	polar white matte	• Frame for RCU-101 in Merten M-PLAN design • Frames for other colors are available on request, see appendix A for item selection

Frame M-PLAN Glass 1-gang

Image	Part Number	Appearance	Features
	MTN489178	glass sapphire	• Frame 1-gang in Merten M-PLAN Glass design • Frames for multiple push button modules are available on request, see appendix A for item selection

Digital output

LON I/O Module DR-N 4S-16A

Image	Part Number	Features
	MTN881831	• Independent switching of four load groups • Four relay outputs (N.O. contacts, 16 A) • Manual operation per output • Status signaling via manual switch • Power-down detection • Supply voltage: DC 24 V • Screw-type terminals • Width of device: approx. 72 mm (4 pitch) • Software application for control of four independent consumer loads according to LonMark profile "Lamp Actuator (3040)" including timers, logic operation, prioritised control and configurable reaction of the outputs to power-up/bus reset. • In addition, four "Scene Controllers (3251)" are available FTT 24VDC UPI

LON I/O Module DR-N 8S 10A

Image	Part Number	Features
	MTN881801	• Independent switching of eight load groups • Eight relay outputs (N.O. contacts, 10 A) • Manual operation and status indication per output • Power-down detection • Supply voltage: DC 24 V • Pluggable screw-type terminals • Width of device: approx. 72 mm (4 pitch) • Software application for control of eight independent consumer loads according to LonMark profile "Lamp Actuator (3040)" including timers, logic operation, prioritised control and configurable reaction of the outputs to power-up/bus reset. • Two "Scene Controllers (3251)" are available. FTT 24VDC UPI

LON I/O Module DR-M 8S 10A

Image	Part Number	Features
	MTN880581	• Independent switching of eight load groups • Eight relay outputs (N.O. contacts, 10 A) • Manual operation and status LED per output • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 72 mm (4 pitch) • Software application for control of eight independent consumer loads according to LonMark profile "Lamp Actuator (3040)" without timers, logic operation or other controllers LPT UPI

Sunblind

I/O MODULE DR-N MSCU4-AC

Image	Part Number	Features
	MTN881811	• Control of four customary sunblinds by use of interference-suppressed standard motors • Eight relay outputs (N.O. contacts, 10 A) • Manual operation and status indication per output • Power down detection • Supply voltage: DC 24 V • Pluggable screw-type terminals • Width of device: approx. 72 mm (4 pitch) • Software application for control of four independent sunblind drives. Opportunity of prioritised control, • Analysis of meteorological data for sunblind protection, scene and group control FTT 24VDC UPI

LON I/O Module DR-M MSE4

Image	Part Number	Features
	MNT880591	• Control of four customary sunblinds by use of interference-suppressed standard motors (AC 230 V) • Eight relay outputs (N.O. contacts, 6 A) • Manual operation and status LED per output • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 72 mm (4 pitch) • Software application for control of four independent sunblind drives. Opportunity for prioritised control, analysis of meteorological data for sunblind protection, scene and group control and configurable reaction of the outputs to power-up and bus reset. LPT UPI

LON SMI-Controller DR 4x16 24V

Image	Part Number	Features
	MTN887281	• Four LoVo SMI outputs to control up to 16 LoVo SMI slaves (motors) each • EIA-232-Interface • TP/FT-10 Interface • Software tool for addressing SMI-Slaves via Ethernet or EIA-232 • Status monitoring of allconnected SMI-Slaves • Status-LED for dianostic and status indication • Manual operation for direcr control of SMI-Slaves • pluggable screw type terminals • Supply voltage 24 VDC • With of device:approx. 157 mm (9 pitch) • Sw application for control of SMI-Slaves including timers, prioritised control etc. FTT IP 24VDC

DALI Controller

LON DALI-Controller DR-S 4DIM

Image	Part Number	Features
	MTN887241	• Control and supply of up to 64 DALI devices, divided into four groups • Addressing of the DALI devices with LNS plug-in • Provides DALI supply voltage, 16 V • Status monitoring of all connected DALI devices • Monitoring of all lamps (if DALI compatible) • Status LEDs for diagnostics and status indication • Manual operation for direct control of DALI devices • DALI device replacement with manual operation • Pluggable screw-type terminals • Supply voltage: AC 230 V • DIN rail mounting according to EN 50 022 • Width of device: approx. 105 mm (6 pitch) • Software application for control of up to 64 DALI devices, divided into four groups including timers, prioritised control and configurable reaction to power-down/power-up/bus reset. In addition, the application provides constant light and scene control according to LonMark profile “Lamp Actuator (3040)”, “Constant Light Controller (3050)” and scene control in the DALI devices DALI FTT 230V SPI

LON DALI-Controller DR-S 8DIM

Image	Part Number	Features
	MTN887251	• Control and supply of up to 64 DALI devices, divided into four or eight groups • There are two software files available (i) for multisensor and ballasts in four groups or (ii) ballast only in eight groups • Addressing of the DALI devices with LNS plug-in • Provides DALI supply voltage, 16 V • Status monitoring of all connected DALI devices • Monitoring of all lamps (if DALI compatible • Status LEDs for diagnostics and status indication • Manual operation for direct control of DALI devices • DALI device replacement with manual operation • Pluggable screw-type terminals• • Supply voltage: AC 230 V • DIN rail mounting according to EN 50 02. width of device: approx. 105 mm (6 pitch)) • The two software applications files available are for control of up to 64 DALI devices, and divided into four or eight groups including timers, prioritised control and configurable reaction to power down/ power up/bus reset. Further more, the application provides constant light and scene control according to LonMark profile “LampActuator (3040)” “Constant Light Control (3050)” and scene control in DALI devices. DALI FTT 230V SPI

LON DALI-Controller DR-S 16DIM

Image	Part Number	Features
	MTN887261	• Features as per LON DALI-Controller DR-S 4DIM (art. no. MTN887241), but this controller can control up to 16 DALI groups DALI FTT 230V SPI

LON DALI Gateway DR 4x16 DIM

Image	Part Number	Features
	MTN887271	• Four DALI outputs to control up to 64 DALI devices for each output, divided into sixteen groups • EIA-232 interface for device configuration • TP/FT-10 transceiver and Ethernet socket • Addressing of the DALI devices with LNS plug-in • Status monitoring of all connected DALI devices • Monitoring of all lamps (if DALI compatible) • Status LEDs for diagnostics and status indication • Manual operation for direct control of DALI devices • Pluggable screw-type terminals • Supply voltage: DC 24 VDC • DIN rail mounting according to EN 50 022 • Width of device: approx. 157 mm (7 pitch) • Software application for control of the DALI devices, including timers, prioritised control and configurable reaction to power-down/power-up/bus reset. In addition, the application provides constant light and scene control according to LonMark profile “Lamp Actuator (3040)”, “Constant Light Controller (3050)” and scene control in the DALI devices • A power supply for the DALI gateway and the DALI devices (art. no. MTN887131) has to be ordered separately if required. DALI IP FTT 24VDC

DALI power Supply DR-N 140

Image	Part Number	Features
	MTN887131	• Power supply for the LON DALI-Gateway REG 4x16 DIM • One output DC 24 V (max. 7 W) • Outputs for the supply of four DALI lines (DC 16 V, 116 mA per output) • LED per output for status and failure indication • Supply voltage: AC 230 V • Temperature range: 5°C .. 40°C • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 72 mm (4 pitch) 230V

DALI Multi-Sensors

DALI Multi-Sensor LA-11

Image	Part Number	Features
	MTN880641	DALI • Combination of occupancy sensor and brightness sensor with DALI interface • Suitable for LON DALI Controller DR-S 8DIM and DALI Gateway REG 4x16 DIM art. no. 36236-332 or DR 4X16 DIM MTN887271 • Flush-mounting (surface-mounting in combination with Surface Mounting Box, art. no.MTN550619) • Circular sensor range with a diameter of approx. 14 m at 2.5 m mounting height • Detection range: 360 degrees • Five detection levels with 284 control segments in 71 zones • Brightness sensor for daylight-dependent light control, sensor range: 10 .. 1,000 Lux • Dimensions of surface-mounted sensor: 105 x 42.6 mm (D x H) • Potential free contact (delayed detection) • Power consumption 16 mA

Occupancy/Motion Detectors

LON ARTEC Motion Detector

Image	Part Number	Appearance	Features
	MTN880971	polar white matt	UPI BCU • Indoor motion detector in Merten ARTEC design • Detetion of movementswithin a horizontal angle of 180 degrees • Motion-dependent control of room functions • Integrated and individually adjustable threshold value switch forbrigtness-dependent light control • Software applcations to translate the detected movements according to LonMark profile “Occupancy sensor (1060)” into LON messages for occupancy-dependent light control and “Occupancy controller(3071)” • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured colour.
	MTN880981	stainless steel	

LON System-M Motion Detector

Image	Part Number	Appearance	Features
	MTN881201	polar white matt	UPI BCU • Indoor motion detector in Merten System-M design • Detection of movements within a horizontal angle of 180 degrees • Motion-dependent control of room functions • Integrated and individually adjustable threshold value switch for brightness-dependent light control • Software application to translate the detected movements according to LonMark profile “Occupancy Sensor (1060)” and “Occupancy Controller (3071)” into LON messages for occupancy-dependent light control • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design.

LON System-M Motion Detector 2.2m

Image	Part Number	Appearance	Features
	MTN881251	polar white matt	• Indoor motion detector in Merten System-M design • Detection of movements for motion-dependent control of room functions • Integrated and individually adjustable threshold value switch for brightness-dependent light control • Area of detection: 180° • Range: 8 m left/right, 12 m at the front • Mounting height: 2.2 m or 1.1 m with half the range • Software application to translate the detected movements according to LonMatk profile “Occupancy Sensor (1060)” and “Occupancy Controller (3071)” into LON messages for occupancy-dependent light control • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured design. UPI BCU

Multi-Sensor LA-21

Image	Part Number	Features
	MTN880541	• Combination of occupancy sensor and brightness sensor • Flush-mounting (surface-mounting in combination with Surface Mounting Box, art. no. 42020-106) • Circular sensor range with a diameter of approx. 14 m at 2.5 m mounting height • Detection range: 360 degrees • Several detection levels with over all 544 control segments in 136 zones • Brightness sensor for daylight-dependent light control, sensor range: 10 .. 1,000 Lux • Dimensions of surface-mounted sensor: 105 x 42.6 mm (D x H) • Software application to translate the detected movements (according to LonMatk profile “Occupancy Sensor (1060)” and “Occupancy Controller (3071)”), resp. the detected brightness (LonMark profile “Light Sensor (1010)”) into LON messages for occupancy-dependent light or sunblind control • The Surface Mounting Box (art no. MTN550619) has to be ordered separately if required. LPT UPI

Multi-Sensor ILA-22

Image	Part Number	Features
	MTN880551	• Combination of occupancy sensor, brightness sensor and IR receiver • IR receiver for control of various room functions (in combination with IR Remote Control, art. no. MTN880991) • Software application to translate the detected movements (according to LonMark profile “Occupancy Sensor (1060)” and “Occupancy Controller (3071)”), resp. the detected brightness (LonMark profile “Light Sensor (1010)”) into LON messages for occupancy-dependent light or sunblind control as well as for control of room functions (LonMark profile “Switch (3200)” and “Scene Panel (3250)”) by use of the received IR signals • Other features as per LON Multi-Sensor LA-21 (art. no. MTN880541) • The IR Remote Control (art. no. MTN880991) and the Surface Mounting Box (art no. MTN550619) have to be ordered separately if required. LPT UPI

Surface Mounting Box for Multi-Sensor LA-21/ILA-22

Image	Part Number	Features
	MTN550619	• For surface-mounting of the LON Multi-Sensor LA-21 (art. no. MTN880541) and ILA-22 (art. no. MTN880551) • Colour: polar white (similar to RAL 9010)

IR Remote Control

Image	Part Number	Features
	MTN880991	• For recalling up to ten different room functions for lighting, sunblinds, etc. • Suitable for the articles LON Room Control Unit RCU-101 (System-M and ARTEC), LON Push button MF-IR, and LON Multi-Sensor ILA-22 • The required batteries, 2 pieces AAA (micro), are not included.

Temperature Controllers

LON ARTEC Temperature Controller RTR-51

Image	Part Number	Appearance	Features
	MTN880951	polar white glossy	• Continuous-action controller for heating and cooling incl. integrated temperature sensor in Merten ARTEC design • Calculates manipulated variables from setpoint and actualtemperature values according to theparticular operation mode • Can control a valve or switching actuator in combination with an electro-thermal control valve • Two different setpoints for heating and cooling • Status LEDs o indicate operation modes like comfort, standby, night, frost/heat protection and controller inhibit • Presence button, to change over from standby to comfort mode • Rotary switch for setpoint adjustment • Degree of protection: IP 20 • Software application according to LonMark profile “Thermostat (8060)” and “Space Comfort Control Command Module (8090)” • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured colour. LPT UPI BCU
	MTN880961	stainless steel	

LON System-M Temperature Controller RTR-51

Image	Part Number	Appearance	Features
	MTN881301	polar white matte	• Continuous-action controller for heating and cooling incl. integrated temperature sensor in Merten System-M design • Other features like LON Artec temperature controller RTR-51 • To be completed with a LON Bus Coupling Unit UP (MTN880451) and a frame in the favoured colour. LPT UPI BCU

Dimmer Output

I/O Module DR-N DIM 500-UNI

Image	Part Number	Features
	MTN881011	• Universal dimmer for switching and dimming of incandescent, • HV-halogen and LV halogen • Lamps with dimmable wound or electronic transformers • Connected load: max. 500 VA • Automatic load detection • Combinations of ohmic and inductive or ohmic and capacitive • Loads are possible, • Combinations of inductive and capacitive loads are not allowed • Electronic short-circuit and overload proof • Power down detection • Status LED and manual switch for ON/OFF • Supply volage: DC 24 V • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 72 mm (4 pitch) • Software application for dimming the light including timers, prioritised control and • configurable reaction to power-up/bus reset. Furthermore, the application provides constant light, scene and occupancy control according to LonMark profile “Lamp Actuator (3040)”, “Constant Light Controller (3050)”, “Scene Controller (3251)” and “Occupancy Controller (3071)” FTT 24VDC UPI

I/O Module DR-N 3DIM 1-10V

Image	Part Number	Features
	MTN881001	• Control of devices with 1-10 V interface (controllable electronic ballasts, electronic transformers etc.) • Three analog outputs (1-10 V) for dimming and three relay outputs (N.O. contact, 16 A) for switching • Current load (analog output): max. 100 mA • Power down detection • Pluggable screw-type terminals • Supply voltage: 24 VDC • Switch for manual control of the relay contact • Screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 75 mm (4 pitch) • Software application for dimming the light including timers, prioritised control and configurable reaction to power-up/bus reset. In addition, the application provides constant light and scene control according to LonMark profile “Lamp Actuator (3040)”, “Constant Light Controller (3050)”, “Scene Controller (3251)” FTT 24VDC UPI

Digital Inputs

LON I/O Module DR-M 4DI

Image	Part Number	Features
	MTN880501	• Connection of devices with floating contacts • Four inputs • Status LED per input • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 45 mm (2.5 pitch) • Software application according to LonMark profile “Switch (3200)”, “Scene Panel (3250)” and “Occupancy Sensor (1060)” for light or sunblind control including configurable pulse-edge evaluation; additionally an application with ”Partition Wall Controller“ is available LPT UPI

LON I/O Module DR-M 4DI AC/DC

Image	Part Number	Features
	MTN880491	• Connection of conventional devices with 24 V output • Four inputs (AC/DC 12 .. 30 V) • Status LED per input • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 45 mm (2.5 pitch) • Software application according to LonMark profile “Switch (3200)”, “Scene Panel (3250)” and “Occupancy Sensor (1060)” for light or sunblind control including configurable pulse-edge evaluation LPT UPI

LON I/O Module DR-M 4DI 230V

Image	Part Number	Features
	MTN880481	• Connection of conventional devices with 24 V output • Four inputs 230V • Connections to different phase conductors • Status LED per input • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 45 mm (2.5 pitch) • Software application according to LonMark profile “Switch (3200)”, “Scene Panel (3250)” and “Occupancy Sensor (1060)” for light or sunblind control including configurable pulse-edge evaluation LPT UPI

LON I/O Module DR-M 8DI AC/DC

Image	Part Number	Features
	MTN880521	• Connection of conventional devices with 24 V output • Eight inputs (AC/DC 12 .. 30 V) • Width of device: approx. 72 mm (4 pitch) • Other features as per LON I/O Module REG-M 4DI AC/DC (art. no. MTN880491) LPT UPI

LON I/O Module DR-M 8DI DC-P

Image	Part Number	Features
	MTN880531	• Connection of devices with floating contacts • Eight inputs • Status LED per input • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 72 mm (4 pitch) • Software application according to LonMark profile “Switch (3200)”, “Scene Panel (3250)” and “Occupancy Sensor (1060)” for light or sunblind control including configurable pulse-edge evaluation LPT UPI

LON I/O Module DR-M 8DI 230V

Image	Part Number	Features
	MTN880511	• Connection of conventional devices with 230 V output • Eight inputs (AC 230 V) • Status LED per input • Pluggable screw-type terminals • DIN rail mounting according to EN 50 022 • Width of device: approx. 72 mm (4 pitch) • Software application according to LonMark profile “Switch (3200)”, “Scene Panel (3250)” and “Occupancy Sensor (1060)” for light or sunblind control including configurable pulse-edge evaluation LPT UPI

Combined In-/Outputs

LON I/O Module DR-N 8DI 8DO AC

Image	Part Number	Features
	MTN881821	• Independent switching of eight load groups • For control of electro-thermal control valves • Eight inputs for connection of devices with floating contacts • Eight outputs: semiconductors AC 24 V (external supply required) • Manual operation and status indication per output and input • Supply voltage: DC 24 V • Pluggable screw-type terminals • Width of device: approx. 72 mm (4 pitch) • Software application for control of eight independant consumer loads according to LonMark profile "Valve Positioner (8131)" or "Lamp Actuator (3040)" (two different applications). The slopes at the digital inputs are translated according to LonMark profile "Switch (3200)" FTT 24VDC UPI

Physical Sensors

LON Multi-Sensor LT-23 AP

Image	Part Number	Features
	MTN887341	• For daylight- and outdoor temperature-dependent controls • Integrated light and temperature sensor • Range of the light sensor: 1 .. 65,000 Lux • Range of the temperature sensor: -20 .. +50 °C • Pole- or wall-mounting • Degree of protection: IP 54 • Dimensions: 93 x 72 x 57 mm (H x W x D) • Application for transmission of the measured values to the LON network (LonMark profile "Light Sensor (1010)" and "Temperature Sensor (1040)") and with threshold value switches for analysis of the detected values LPT UPI

LON Indoor Temperature Sensor AP RTS-10

Image	Part Number	Features
	MTN887401	• For indoor temperature-dependent controls • Integrated temperature sensor • Measuring range of temperature sensor: -5 .. +50 °C • Wall-mounting • Degree of protection: IP 20 • Dimensions: 73 x 73 x 24 mm (H x W x D) • Application for transmission of the measured values to the LON network according to LonMark profile "Temperature Sensor (1040)" and with threshold value switch for analysis of the detected values LPT UPI

LON Valve Actuator SA-22

Image	Part Number	Features
	MTN887391	• Heating and cooling applications • Two inputs for floating contacts (e. g. for window control, occupancy sensors or dew point detectors etc.) • Regular automatic valve adjustment and valve lift detection • Service pin and service LED • Status LEDs to indicate the valve lift • Connection via pre-assembled, fixed cable (approx. 1 m) • Very low-noise operation • Mounting on thermostatic valve connection thread M30x1.5 • Dimensions: 82 x 50 x 65 mm (H x W x D) • Software application for drive control and analysis of the digital input values according to the applicable LonMark profiles LPT UPI

Special color selection

Wall Unit inserts

These items are not available on stock, has to be ordered on request

Art. Description	Art. Number Insert	Color
LON PB.1g	MTNS881401-04	active white glossy
LON PB.1g	MTNS881401-03	polar white glossy
LON PB.1g	MTNS881401-01	matte anthracite
LON PB.1g	MTNS881401-02	aluminium
LON PB.2g	MTNS881451-04	active white glossy
LON PB.2g	MTNS881451-03	polar white glossy
LON PB.2g	MTNS881451-01	matte anthracite
LON PB.2g	MTNS881451-02	aluminium
LON PB.4g	MTNS881501-04	active white glossy
LON PB.4g	MTNS881501-03	polar white glossy
LON PB.4g	MTNS881501-01	matte anthracite
LON PB.4g	MTNS881501-02	aluminium
LON MF PB.4g	MTNS881601-04	active white glossy
LON MF PB.4g	MTNS881601-03	polar white glossy
LON MF PB.4g	MTNS881601-01	matte anthracite
LON MF PB.4g	MTNS881601-02	aluminium
LON MF PB.IR 4g	MTNS881651-04	active white glossy
LON MF PB.IR 4g	MTNS881651-03	polar white glossy
LON MF PB.IR 4g	MTNS881651-01	matte anthracite
LON MF PB.IR 4g	MTNS881651-02	aluminium
LON RCU-61	MTNS880601-04	active white glossy
LON RCU-61	MTNS880601-03	polar white glossy
LON RCU-61	MTNS880601-01	matte anthracite
LON RCU-61	MTNS880601-02	aluminium
LON RCU-101	MTNS880621-04	active white glossy
LON RCU-101	MTNS880621-03	polar white glossy
LON RCU-101	MTNS880621-01	matte anthracite
LON RCU-101	MTNS880621-02	aluminium
LON Motion Detector	MTNS881201-04	active white glossy
LON Motion Detector	MTNS881201-03	polar white glossy
LON Motion Detector	MTNS881201-01	matte anthracite
LON Motion Detector	MTNS881201-02	aluminium
LON Motion Detector 2.2m	MTNS881251-04	active white glossy
LON Motion Detector 2.2m	MTNS881251-03	polar white glossy
LON Motion Detector 2.2m	MTNS881251-01	matte anthracite
LON Motion Detector 2.2m	MTNS881251-02	aluminium
LON RTR-51	MTNS881301-04	active white glossy
LON RTR-51	MTNS881301-03	polar white glossy
LON RTR-51	MTNS881301-01	matte anthracite
LON RTR-51	MTNS881301-02	aluminium

Sample pics *insert/ frame*

Anthracite/ Anthracite

Aluminium /Aluminium

Aluminium / Anthracite

Anthracite / Aluminium

Special color selection

System M frames

Art. Description	Art. Number Frame	Color
Frame M-SMART 1-gang	MTN478125	active white glossy
Frame M-SMART 1-gang	MTN478119	polar white glossy
Frame M-ARC 1-gang	MTN485170	polar sand matte
Frame M-ARC 1-gang	MTN485178	midnight blue matte
Frame M-ARC 1-gang	MTN485114	matte anthracite
Frame M-ARC 1-gang	MTN485160	aluminium matte
Frame M-STAR 1-gang	MTN467114	satinsilver/anthracite
Frame M-STAR 1-gang	MTN477114	chrome/anthracite
Frame M-STAR 1-gang	MTN487114	polished brass/anthracite
Frame M-PLAN 1-gang	MTN486114	matte anthracite
Frame M-PLAN 1-gang	MTN486160	aluminium matte
Frame M-PLAN for RCU-101	MTN587314	matte anthracite
Frame M-PLAN for RCU-101	MTN587360	aluminium matte
Frame M-PLAN Glass 1-gang	MTN489160	glass diamond
Frame M-PLAN Glass 1-gang	MTN489106	glass ruby red
Frame M-PLAN Glass 1-gang	MTN489115	glass mahagony
Frame M-PLAN II 1-gang	MTN488119	polarwhite matte
Frame M-PLAN II 1-gang a	MTN488114	matte anthracite
Frame M-PLAN II 1-gang	MTN488160	aluminium matte
Flush Mounting Adapter for M-PLAN II Frames	MTN512403	

Special color selection

System M frames

M-Plan

MTN486114

MTN486160

MTN489115

MTN587314

MTN587360

MTN489160

MTN489106

M-Arc

MTN485170

MTN485178

MTN485114

MTN485160

M-Star

MTN477114

MTN487114

MTN467114

M-Plan II

MTN488119

MTN488114

MTN488160

MTN512403

M-Smart

MTN478125

MTN478119

Object matrix

Article name	Article number	Switch	Lamp Actuator	Light Sensor	Occupancy Sensor	Occupancy Controller	Constant Light Controller	Scene Controller	Scene panel	Sunblind Controller	Sunblind Actuator
Bus Coupling Unit											
LON Bus Coupling Unit UP	MTN880451	10			1				1		
Digital Inputs											
LON I/O-Module DR-M 4DI xxx	MTN880xxx	4			1				1		
LON I/O-Module DR-M 8DI xxx	MTN880xxx	8			1				1		
Digital Outputs											
LON I/O-Module DR-N 4S 16A	MTN881831		4			1		4			
LON I/O-Module DR-M 8S 10A	MTN880581		8								
LON I/O-Module DR-N 8S 10A	MTN881801		8					2			
Combined In-/Outputs											
LON I/O-Module REG-N 8DI 8DO AC	MTN881821	8	8								
Sunblind											
LON I/O-Module DR-M MCU4	MTN880591								1	4	4
LON I/O-Module DR-N MSCU4 AC	MTN881811									4	4
DALI Controller/Gateway											
LON DALI-Controller DR-S 4DIM	MTN887241		4				4	***			
LON DALI-Controller DR-S 8DIM	MTN887251		8				4	***			
LON DALI-Controller DR-S 16DIM	MTN887261		16				1	***			
LON DALI-Gateway DR 4x16 DIM	MTN887271		64		**		**	**			
Dimmer Outputs											
LON I/O-Module DR-N 3DIM 1-10V	MTN881001		3				3	2			
LON I/O-Module DR-N DIM 500-UNI	MTN881011		1			1	1	1			
Occupancy/Motion Detectors											
LON Multisensor LA-21	MTN880541			1	2	2					
LON Multisensor ILA-22	MTN880551	10		1	2	2			1		

Short Object Description

Lamp actuator 3040

The lamp actuator is used with switch and controller devices such as the constant light controller and scene controller. The switch object output nvoSwitch is connected to the input nviLampValue of the lamp actuator. Controller objects can be used between switch type sensors and lamp actuators. In cases of multiple sensors the feedback connection can be used to synchronize a group of switches.

Occupancy controller 3071

Typically the occupancy controller input is connected to the occupancy sensor and the output to a lamp actuator. A switch can be used to turn the occupancy controller into ON and OFF mode. An additional switch can override the controller and directly control the lamp.

Switch 3200

When the switch object is used directly the switch object output is connected to a lamp actuator object input. When several switches are connected to the same group of lamps, a feedback connection can be used to synchronize the group of switches. The lamp output is connected to switches (feedback A) or switches can be connected to other switches (feedback B). When lamps are controlled by a controller, such as a constant light controller or scene controller, the optional setting output is used to change the mode and/or the setpoint of the controller.

Scene panel 3250

The scene panel object output is connected to the scene controller object input. Each lamp or group of lamps have their own controller. When several scene panels are connected to the same controller or group of controllers, an optional feedback connection can be used to synchronize panels. An optional control output is used for “manual” adjustment (“master fade”) of the scene. Local control of a lamp can be done with a switch. When lamps are adjusted locally, a new scene can be stored using “learn current” configuration property. The function stores current values under the given scene number. Configuration properties are not shown in this example.

Constant light controller 3050

Typically the constant light controller input is connected to a light sensor and the output to a lamp actuator. A switch can be used to turn the constant light controller object into AUTO and OFF mode. Also the illumination level setpoint can temporarily be adjusted upwards and downwards.

*Usable objects are due to application module

**Configurable

***With support of the scene control in the DALI devices

An additional switch can override the controller. When manual override input is written to, the constant light controller object is turned into MANUAL mode and the data is directly passed to the lamp.

Scene controller 3251

The scene panel output is connected to the scene controller input. Each lamp or group of lamps have their own controller. An optional control input is used for “manual” scene adjustment (master fade). Local control of a lamp can be done with a switch. When lamps are adjusted manually, a new scene can be stored using “learn current” configuration property. Configuration properties are not shown in this example.

Light sensor 1010

The light sensor is used with controller objects such as the constant light controller. Typically the light sensor output is connected to the constant light controller input.

Occupancy controller 3071

The occupancy sensor object can be used to detect occupancy in a room or an area. The output of the occupancy sensor object is connected to a controller, which is controlling lights. The occupancy controller takes care of the proper action and calculates application delay or hold times as appropriate. The number and type of input variables of the controller may vary

Sunblind actuator 6110

Typically, the Sunblind Actuator functional block receives input from a Switch functional block (32.00), from a building-management system (BMS), or from a Sunblind Controller functional block. The outputs from the Sunblind Actuator functional block are used to report the present state of the sunblind.

Sunblind controller 6111

The Sunblind Controller Functional Block may interact with one or more of the following LonMark Functional Block:

- Switch Functional Block #3200
- Scene Panel Functional Block #3250
- Scheduler Functional Block #3301
- BMS and monitoring node
- Space Comfort Controller #8500
- Various sensor functional blocks.

Typically the Sunblind Controller output is connected to the input of a set of Sunblind Actuators. A sunblind switch may be used to have manual access to the Sunblind Controller. A BMS (Building Management System) may influence the controller and the resulting decision is directly transmitted via SNVT_setting to a sunblind actuator functional blocks.

WORLD TRADE CENTER

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